Message

From: LEE, LILY [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D6085A744F9347E6836C54C0E85B97B2-LLEE06]
Sent: 7/15/2015 7:06:56 AM
To: Bacey, Juanita@DTSC [Juanita.Bacey@dtsc.ca.gov]
Subject: Excerpts from Rad RACR - Parcel G - City wants residential use - attached documents
Attachments: Parcel G Radiological Removal Action Completion Report Part 1_Hunters Point_12.02.2011.pdf; Final Parcel G ROD.TextTablesFigures.Attachments1,2_02.24.09.pdf

Dear Nina,

FYI, in case these excerpts help narrow your search for the relevant documentation for rad & residential scenario evaluation:

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From: LEE, LILY
Sent: Tuesday, July 14, 2015 11:57 PM
To: Terry, Robert
Subject: Excerpts from Rad RACR - Parcel G - City wants residential use - attached documents

Dear Rob,

Thank you for agreeing to review the ROD and Rad RACR to evaluate whether the Rad cleanup on Parcel G meets current residential standards. In case it helps, I've cut & pasted some relevant excerpts from the Rad RACR section attached in pdf form:

Storm Drain and Sanitary Sewer Systems

p. 10 of pdf, p. ES-6 of hard copy – "Dose and risk modeling using the most current version of RESRAD software and the larger of the method detection limit or reported activity was performed for each of the Parcel G trench survey units and documented in the SUPRs. Based on the Parcel G trench survey unit dose and risk modeling results, the highest net residual dose to workers or members of the public as a result of exposure to radioactive material in soil was identified in Trench Survey Unit 115 at 7.696 mrem/y with an excess lifetime cancer risk of $1.387 \times 10\text{-}4$. These results meet the HPNS dose criterion of less than 15 mrem/y and risk criterion of less than $3 \times 10\text{-}4$, which supports radiological free release."

p. 66 -"Dose and risk modeling was performed for each of the 63 Parcel G trench survey units using the default residential farmer scenario provided in the most current version of RESRAD software at the time of the modeling exercise."

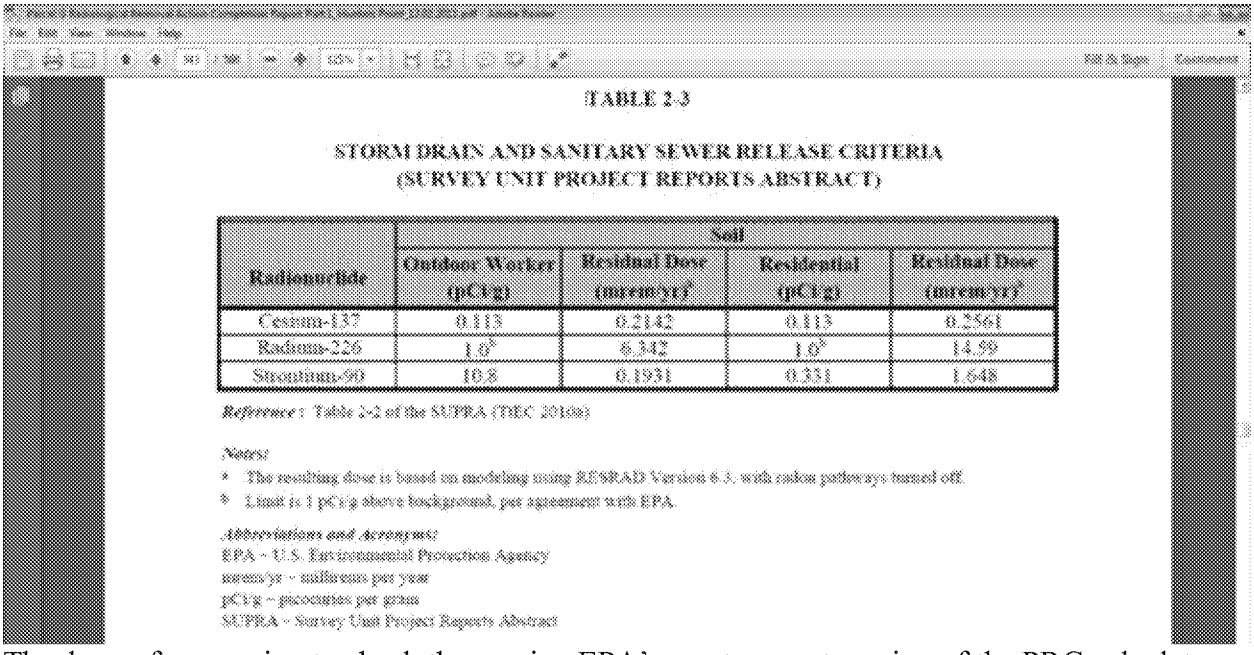

TABLE 2-3

STORM DRAIN AND SANITARY SEWER RELEASE CRITERIA
(SURVEY UNIT PROJECT REPORTS ABSTRACT)

Radionuclide	Soil			
	Outdoor Worker (pCi/g)	Residual Dose (mrem/yr)*	Residential (pCi/g)	Residual Dose (mrem/yr)*
Cesium-137	0.113	0.2142	0.113	0.2561
Radium-226	1.0*	6.342	1.0*	14.99
Strontium-90	10.8	0.1931	0.331	1.648

Reference: Table 2-2 of the SUPRA (TEC 2010a)

Notes:
* The resulting dose is based on modeling using RESRAD Version 6.3, with radon pathways turned off.
* Limit is 1 pCi/g above background, per agreement with EPA.

Abbreviations and Acronyms:
EPA = U.S. Environmental Protection Agency
mrem/yr = millirems per year
pCi/g = picocuries per gram
SUPRA = Survey Unit Project Reports Abstract

Thank you for agreeing to check these using EPA's most current version of the PRG calculator.

Buildings and Former Buildings Site
p. 68 –"The NRC radiological release limit for unrestricted use was applied in assessing the results of the building and former building site surveys."
These will be demolished and disposed of, so no anticipated exposure to future residences. So I presume the buildings are not relevant to this question.

Would the RESRAD software have changed since then in a way that would require any recalculation for a residential exposure scenario?

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From: LEE, LILY
Sent: Monday, July 13, 2015 11:27 AM
To: Terry, Robert
Subject: Parcel G - City wants residential use - attached documents

Dear Rob,

Here is the summary text from the Parcel G ROD and Rad RACR. Below I have cut & pasted excerpts from the ROD. The City is eager to find out if regulatory agencies think more cleanup would be needed under a residential use vs. industrial/commercial scenario.

Additionally, radiological risk was calculated based on estimated concentrations of radiological contamination at radiologically impacted sites, using remediation goals for each radionuclide of concern. Actual calculated risk will be based on field measurements following receipt of final status survey results for each impacted site. **Radiological risks**(19) for soil and

building structures are greater than 10^{-6} at Redevelopment Blocks 30A, 38, and 39 (see Table 2). Total and incremental risks were also calculated for radionuclides with Radium-226, the only naturally occurring radionuclide that affected the incremental risk calculation. However, the background concentration of Radium-226 in building materials was assumed to be zero.

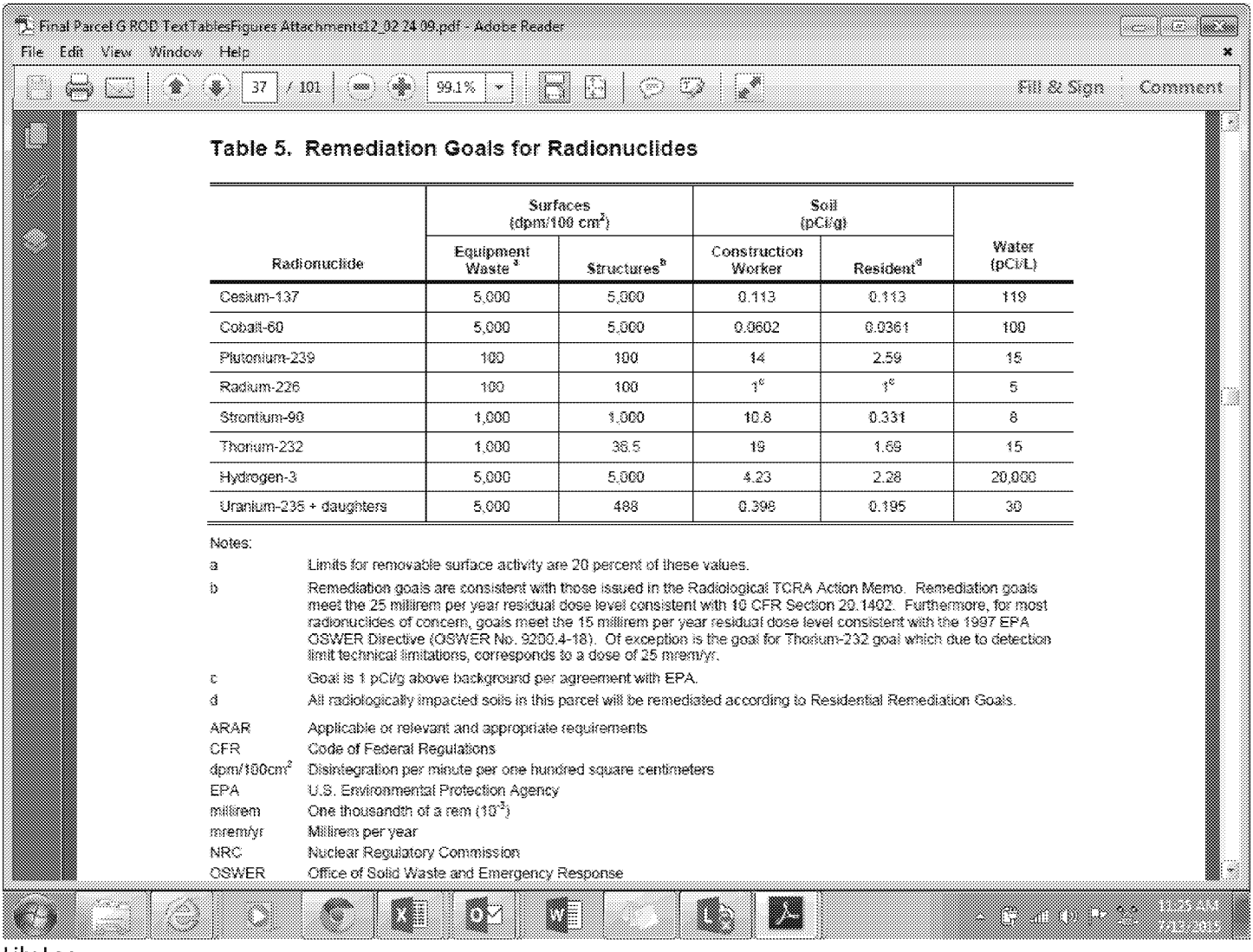
Final Parcel G ROD TextTablesFigures Attachments12_02 24 09.pdf - Adobe Reader

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Table 5. Remediation Goals for Radionuclides

Radionuclide	Surfaces (dpm/100 cm²)		Soil (pCi/g)		Water (pCi/L)
	Equipment Waste [a]	Structures [a]	Construction Worker	Resident [d]	
Cesium-137	5,000	5,000	0.113	0.113	119
Cobalt-60	5,000	5,000	0.0602	0.0361	100
Plutonium-239	100	100	14	2.59	15
Radium-226	100	100	1[c]	1[c]	5
Strontium-90	1,000	1,000	10.8	0.331	8
Thorium-232	1,000	38.5	19	1.69	15
Hydrogen-3	5,000	5,000	4.23	2.28	20,000
Uranium-235 + daughters	5,000	488	0.398	0.195	30

Notes:

a Limits for removable surface activity are 20 percent of these values.

b Remediation goals are consistent with those issued in the Radiological TCRA Action Memo. Remediation goals meet the 25 millirem per year residual dose level consistent with 10 CFR Section 20.1402. Furthermore, for most radionuclides of concern, goals meet the 15 millirem per year residual dose level consistent with the 1997 EPA OSWER Directive (OSWER No. 9200.4-18). Of exception is the goal for Thorium-232 goal which due to detection limit technical limitations, corresponds to a dose of 25 mrem/yr.

c Goal is 1 pCi/g above background per agreement with EPA.

d All radiologically impacted soils in this parcel will be remediated according to Residential Remediation Goals.

ARAR Applicable or relevant and appropriate requirements
CFR Code of Federal Regulations
dpm/100cm² Disintegration per minute per one hundred square centimeters
EPA U.S. Environmental Protection Agency
millirem One thousandth of a rem (10^{-3})
mrem/yr Millirem per year
NRC Nuclear Regulatory Commission
OSWER Office of Solid Waste and Emergency Response

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